INTRODUCTION TO HEALTH CARE TECHNOLOGY

DOE #5212
CIP Code: 51.0999 Allied Health Diagnostic, Intervention, and Treatment Professions, Other

Introduction to Health Care Technology is a course designed to expose students to instruments and equipment used in the health care industry. Emphasis is placed on medical diagnosis and treatment, health maintenance, and disease prevention. Various instructional strategies and technologies will be used to integrate concepts from computer science, physics, anatomy and physiology, and medical terminology in the context of diagnostic and treatment procedures within the health care system. Current and future trends in the health care industry will also be integrated throughout the course. Students will have the opportunity to further explore concepts of health and wellness from the perspective of both the health consumer and health provider. Site visits will provide students the opportunity to continue to explore individual career interests as they see how technology drives health care. Students have the opportunity to develop leadership skills in HOSA and to participate in competitive events at both the state and national level in a wide variety of skills related to their interests.

- Recommended Grade Level: 12
- Required Prerequisite: None
- Recommended Prerequisite: Anatomy and Physiology, Introduction to Health Care Systems or Integrated Health Sciences I&II, two years of science, two years of mathematics, a grade point average of C or higher
- Credits: A one semester course, two to three credits per semester
- A Core 40, Core 40 with Academic Honors, and Core 40 with Technical Honors diploma directed elective course
- A Career Academic Sequence, Career-Technical program, or Flex Credit course
- Academic content standards: http://www.doe.state.in.us/octe/health/hce/health_care_technology.pdf
- Curriculum Framework: http://www.doe.state.in.us/octe/health/hce/health_care_technology.pdf
- Teacher Requirements: http://doe.state.in.us/dps/licensing/assignmentcode
- Funding: State Additional Pupil Count (APC) vocational funding available if taught by CTE licensed Health Sciences teacher

Content Standards and Competencies

The following content standards and performance expectations represent what students should know and be able to do at the conclusion of the course. The content standards and competencies do not define a specific sequence for teaching and learning. While all content standards and expectations should be addressed in some way, teaching order and areas of emphasis will vary according to local needs.

1. **CAREER OPTIONS**: DESCRIBE CAREER OPTIONS IN THE FIELD OF HEALTH CARE TECHNOLOGY.
1.1. Describe career opportunities in nuclear medicine, radiology, medical laboratory services, and biomedical technology.
1.2. Describe the educational requirements for registration/certification/licensure in nuclear medicine, radiology, medical technology, and biomedical technology.
1.3. Describe the role and responsibilities of a Biomedical Technologist, Radiologist, and Medical Technologist.

2. **INFORMATION**: USE COMPUTERS TO ACCESS, PROCESS, AND RETRIEVE INFORMATION.
2.1. Utilize keyboarding skills to access, process, and retrieve information.
2.2. Identify the processes for the collection and dissemination of health care data.
2.3. Describe the uniqueness of electronic charting.
2.4. Compile information from a variety of sources to develop a patient profile.

3. **DIAGNOSTIC AND TREATMENT MODALITIES**: RELATE KNOWLEDGE OF DISEASES AND DISORDERS TO DIAGNOSTIC AND TREATMENT MODALITIES.
3.1. Relate common diseases and disorders to anatomical structure and physiological function using appropriate medical terminology.
3.2. Identify the technology utilized in the diagnosis and treatment of common diseases and disorders.
3.3. Give examples of contrast media and describe the action of each.
3.4. Explain the importance of knowing how instruments and equipment function to ensure accurate and timely testing of patients' specimens.
3.5. Describe how diagnostic procedures relate to the formation of patients' diagnostic and treatment modalities.
3.6. Interpret technical information found in diagnostic test results, health and wellness charts, graphs, tables, as well as physicians' progress reports.

4. **INSTRUMENTS AND EQUIPMENT**: DESCRIBE THE INSTRUMENTS AND EQUIPMENT USED IN THE DIAGNOSIS AND TREATMENT OF COMMON DISEASES AND DISORDERS.
4.1. Describe the appropriate use of a variety of monitoring systems such as: vital signs, apnea, hemodynamic, exercise, and home monitoring systems.
4.2. Describe the relationship between physiological response and the computer display as seen in endoscopy, cardiac catheterization, pacemakers, ventilators, and defibrillators.
4.3. Explain the relationship between biofeedback techniques and the monitoring system.
4.4. Describe the physics of imagery: ultrasound and x-ray.
4.5. Define tomography.
4.6. Compare magnetic resonance imaging (MRI) with computerized axial tomography (CAT scan) and positron emission tomography (PET).
4.7. Explain how the electron microscope differs from the conventional microscope.
4.8. Compare the technique of laser surgery with that of conventional surgery.

5. **PATIENT TEACHING**: EXPLAIN TEST PREPARATION AND PROCEDURES TO PATIENTS IN ORDER TO GAIN ACCURATE RESULTS.
5.1. Explain the purpose of specific diagnostic procedures to patients.
5.2. Explain to the patient what he/she can expect to happen during a specific procedure.
5.3. Instruct the patient regarding his/her role in a specific procedure.
5.4. Anticipate questions patients might have regarding routine diagnostic procedures.

6. **PERFORMANCE**: PERFORM SELECTED DIAGNOSTIC PROCEDURES USING VARIOUS KINDS OF INSTRUMENTS AND EQUIPMENT.
6.1. Record patient data electronically.
6.2. Measure blood oxygen level using an oximeter.
6.3. Measure blood sugar using a glucometer.
6.4. Measure blood cholesterol using a cholestech.
6.5. Calibrate an IV infusion pump, a medication pump, and a Holter monitor.
6.6. Position electrodes in preparation for obtaining an EKG strip.
6.7. Operate an EKG machine, describe the process, and interpret the strip.
6.8. Operate a BMR machine and describe the significance of the results.
6.9. Interpret and instruct a patient regarding monitors on exercise equipment.
6.10. Participate in biofeedback techniques and explain the underlying principles.

7. **LEGAL AND ETHICAL CONSIDERATIONS**: DESCRIBE THE LEGAL AND ETHICAL IMPLICATIONS OF CURRENT AND EMERGING TRENDS IN DIAGNOSTIC AND TREATMENT MODALITIES.
7.1. Describe the effect of cultural and religious diversity on various diagnostic and treatment modalities.
7.2. Describe the impact of the continuing increase in the use of computerized data bases on patient confidentiality.
7.3. Write a living will.

8. **EMERGING TECHNOLOGIES**: RELATE CURRENT AND EMERGING TECHNOLOGIES TO THE FUTURE OF HEALTH CARE.
8.1. Explore emerging technologies.
8.2. Describe the possible impact of one or more emerging technologies on the economy, health care management, and medical education.

9. **RESEARCH**: DEMONSTRATE ACQUIRED KNOWLEDGE OF INSTRUMENTS AND EQUIPMENT REPRESENTATIVE OF PERSONAL INTERESTS IN THE HEALTH CARE FIELD.
9.1. Prepare a presentation using audio-visual materials that illustrates instruments and equipment used in diagnostic and treatment procedures.
9.2. Present a research paper, with accompanying audio-visuals, focusing on the instruments and equipment commonly used to diagnose and treat a specific disease or disorder.